Docket: AM-8304
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Date: 9 June 2008

Charles S. Guenzer

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Wolfgang ADERHOLD	**Attorneys Docket:**	AM-8304
Serial No.:	10/788,979	**Confirmation No.:**	6862
Filed:	February 27, 2004	**Art Unit No.:**	3742
Examiner:	S. Y. Paik		

For: "BACKSIDE RAPID THERMAL PROCESSING OF PATTERNED WAFERS"

Commissioner for Patents
Alexandria, VA 22313-1450

REPLY BRIEF UNDER 37 CFR §41.41

Sir:

This Reply Brief is filed in support of the appeal of the above application dated September 13, 2007 and in response to the Examiner's Answer dated April 29, 2008.

The Examiner's short section on Grounds of Rejection offers no reason to use the upward facing apparatus of Ballance or Anderson with the downward facing wafer of Moslehi's vastly different apparatus beyond a statement that the adaptation would be "as desired by the user". Moslehi '538 is the closest art including a downward facing wafer with wafer pyrometry from

above of the wafer backside. That is, the most relevant prior-art reference teaches against the invention. Nonetheless, the Examiner's ignores Moslehi configuration and states its obvious to instead Ballance's wafer pyrometry from below. Each reference must be read as a whole and as a recitation of parts freely substituted for different parts in different references.

The claimed combination of backside heating and frontside pyrometry on a downwardly facing wafer provides the unexpected result of more uniform heating of an unpatterned wafer backside and pyrometry monitoring directly the features being formed on the wafer frontside, all performed in an RTP chamber having gross features that have long been commercially available.

The Examiner continues to fail to provide any prior art for supporting the wafer within the edge exclusion zone beyond a conclusory statement about its advantages of no overlap or not limiting the working surface. These statements were derived in hindsight and not from the prior art or prior known practice. Moslehi '499 is the only reference providing any details of the support structure for an inverted wafer. His three support pins 50 are small enough that they likely fit within the areas of the unpatterned dye regions 56 of FIG. 1 of the present application and are not limited by the smaller edge exclusion region 52. However, the shelf of claim 3 and the annular ring of claim 13 advantageously do not use the disadvantageous point support of Moslehi '499 but accomplishes the extended support while imposing the additional condition of the edge exclusion zone. The demanding edge exclusion condition is not required for the backside support provided by prior art support rings.

The Examiner in his rebuttal on page 5 dismisses the difference between "pyrometrically monitoring said front side of said substrate" in claim 1 with Anderson's pyrometers directed to the heat shields at the front and back of the wafer. Anderson states at col. 6, ll. 1-4 that the detected temperatures of the heat plates 60, 62 "are indicative of the temperature of the wafer 12" thereby "indirectly obtaining the temperature of the wafer 12."

First, this interpretation of Anderson fails to conform to the described pyrometric monitoring of the wafer surface rather than of a shield surrounding the wafer. Anderson clearly differentiates the pyrometric monitoring of his heat shield from the indirect and only indicative

temperature measurement of the included wafer. Anderson is irradiating his heat shield, not his wafer. Accordingly, the wafer temperature may follow though not track precisely the shield temperatures but a direct monitoring of the wafer temperature provides superior results.

Secondly, the claim recites the pyrometric monitoring of the substrate front side, not the temperature monitoring of the substrate itself. Anderson does not claim that he is measuring even indirectly the temperature of the wafer front side.

Thirdly, the question is whether Anderson's apparatus including both the pyrometers and the heat shields can be obviously combined with the two Moslehi references. The backside wafer pyrometry and the transmission measurements of the wafer temperature by Moslehi would be defeated by placing Moslehi's wafer inside a cavity formed by Anderson's two heat plates.

Anderson is pyrometrically monitoring the temperature of the walls of a black body cavity which is not obviously adapted to the pyrometric monitoring of the wafer as disclosed by Moslehi '538.

Further, dependent claim 2 requires measuring temperatures at a plurality of radial positions on the substrate. Anderson's single pyrometer on the wafer front side would be incapable of detecting plural temperatures at different radii. His pyrometer measures even indirectly only a single temperature within the black body cavity. His heat shield are designed to provide a uniform temperature within the cavity.

On page 6, the Examiner attempts to read pyrometry upon the laser beam and infrared detector 59 of Moslehi '538. As is evident from the description at col. 5, l. 56 to col. 6, l. 13, the laser beam of Moslehi '538 is ancillary to pyrometry performed otherwise, presumably with the pyrometers 26, 28 of FIG. 1, and provides measured values of emissivity and reflectivity, not temperature as measured by the pyrometers. Applicants have merely stated that the laser beams and IR detectors of Moslehi '499 do not themselves constitute pyrometry. Moselhi '538 and Applicants use a common definition of pyrometry not involving of itself probe beams. The Examiner cannot at this late stage introduce a wider definition of pyrometry not supported in any of the applied art. "[C]laims must be read in view of the specification, of which they are a part

and the "specification is the single best guide to the meaning of a term." *In re Translogic Technology*, 84 USPQ 2d, 1929, 1935 (Fed. Cir. 2007).

For these reasons, the Board is requested to instruct the Examiner to withdraw his rejections.

Respectfully submitted,

Date:_____

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